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10/574,656

04/04/2006

Sang Ik Lee

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EXAMINER

RAHIM, AZIM

ART UNIT

PAPER NUMBER

3744

MAIL DATE

DELIVERY MODE

03/13/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



<b>Office Action Summary</b>	<b>Application No.</b> 10/574,656	<b>Applicant(s)</b> LEE ET AL.	
	<b>Examiner</b> AZIM RAHIM	<b>Art Unit</b> 3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 and 22-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 and 22-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |



**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Jeon (US 5,941,085).

Regarding claim 1, Jeon discloses a refrigerator [figure 2] comprising: a cold air duct (140) configured to receive cold air circulating inside of a refrigerating chamber (130) and a freezing chamber (120) [duct 140 is positioned in a fashion to receive air from the refrigerating chamber and the freezing chamber via ducts 125 and 135]; an evaporator (160) in the cold air duct [illustrated in figure 2]; at least one defrosting heater (170) in the cold air duct [illustrated in figure 2] configured to selectively emit heat [see column 5, lines 13-17]; a fan (180) in the cold air duct [illustrated in figure 2], that selectively directs the cold air in upwardly [see column 5, lines 1-5], a motor (185) that drives the fan [see column 5, lines 1-5]; and open/close device (290) disposed at the upper side of the space [illustrated in figure 2] that closes a space having the evaporator, the defrosting heater, and the fan positioned therein [see column 9, lines 59-64], wherein the open/close device is configured to be rotated by a force of a flow of the cold air generated by the rotation of the fan [as illustrated in figure 2, the open/close device and the fan



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are positioned in a fashion to allow this function to be performed]. It is noted that the applicant has not established the extent of the space being closed and the Examiner has interpreted that the space can be closed off to the freezer chamber.

Regarding claim 7, Jeon discloses that the fan is positioned over the evaporator [as illustrated in figure 2, the fan is positioned above the evaporator].

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1, 10-13, 17, 18, 20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schenk et al. in view of Carlstedt et al. (US 5,765,384).



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Regarding claims 1, 10-13 and 22, Schenk et al. disclose a refrigerator [figures 1 and 2] comprising: a cold air duct (46) configured to receive cold air circulating inside of a refrigerating chamber (22) and a freezing chamber (24) [as illustrated in figure 2, the cold air duct is positioned in a fashion to enable air circulation within the refrigerating and freezing chambers]; a fan (40) in the cold air duct [illustrated in figure 2], that selectively directs the cold air in upwardly and downwardly [illustrated in figure 2], a motor (42) that drives the fan [see column 4, lines 41-44]; an evaporator (30) in the cold air duct [illustrated in figure 2] including; a refrigerant pipe [annotated in the figure below corresponding to conduit 32 in figure 2] having refrigerant flowing therethrough [column 4, lines 36-39], and fins [annotated in figure below] on an outside and in contact with the refrigerant pipe [illustrated below];.and open/close means (48) provided at a lower portion of a space [the space where the evaporator and fan are disposed as illustrated in figure 2], that opens and closes the space, having the evaporator and the fan positioned therein [see column 4, lines 49-54], wherein the open/close device is configured to be rotated by a force of a flow of the cold air generated by the rotation of the fan [as illustrated in figure 2, the open/close device and the fan are positioned in a fashion to allow this function to be performed]. It is noted that the applicant has not established the extent of the space being closed and the Examiner has interpreted that the space can be closed off to the freezer chamber.

Schenk et al. fail to disclose at least one defrosting heater in the cold air duct in contact with the fins for selective emission of heat; wherein the defrosting heater includes; a hot wire that functions as a resistance body connected to a power source for emission of heat, and a film of an electrical insulating material surrounding the hot wire.

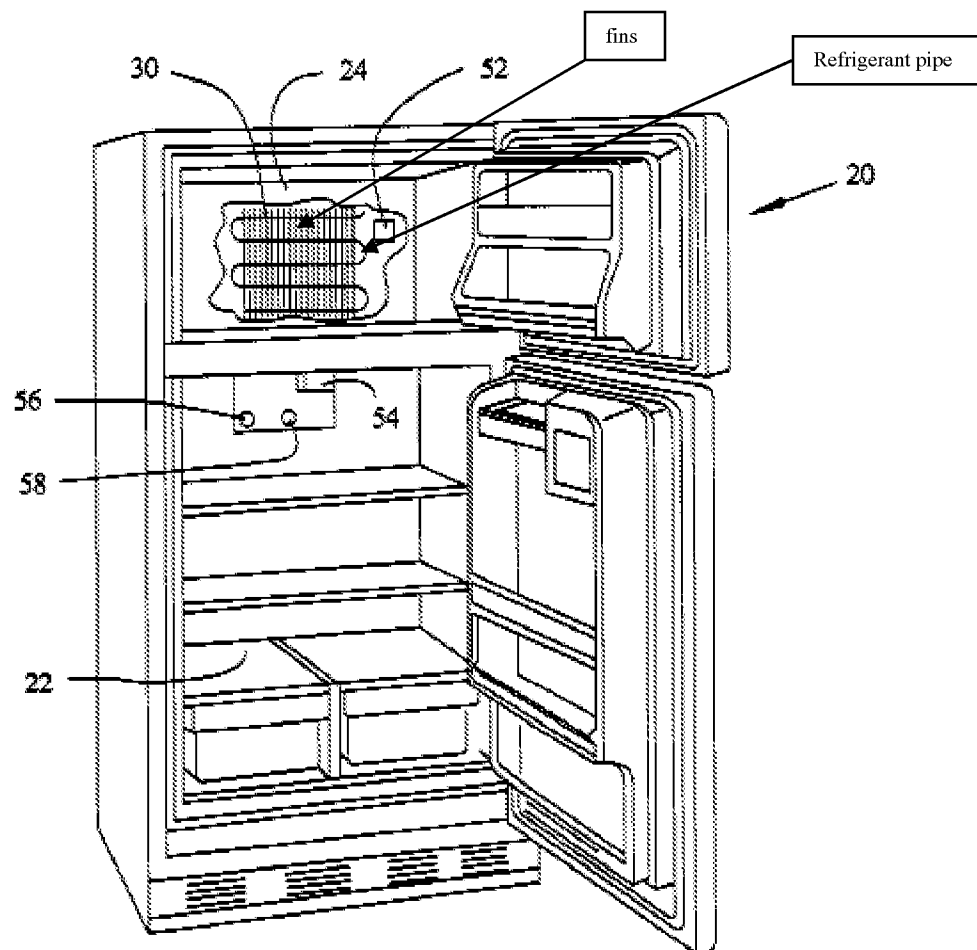


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Carlstedt et al. teach the concept of providing an evaporator (10) having an electric cable (20) for defrosting the evaporator [see abstract]; wherein electric current is conducted through a resistance wire (24) [see column 2, lines 3-5], having a thin film (insulation 26) surrounding the resistance wire [illustrated in figure 1].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the refrigerator of Schenk et al. to include the defrost heater as taught by Carlstedt et al. in order to prevent ice buildup on the evaporator from clogging the cold air duct, thus increasing cooling efficiency.





Regarding claims 17 and 18, Carlstedt et al. teaches that the defrosting heater is attached to a surface of the fins [as illustrated in figure 1, electric heating cable 20 is integrally attached to fins 14 of evaporator 10]. It is noted that since the electric heating cable is attached to the surface of the fins, it is also connected to a side of the fins.

Regarding claim 20, Schenk et al. as modified by Carlstedt et al. teach all the limitations of the claimed invention, but Schenk et al. fail to explicitly teach that the plurality of fins of the evaporator have insertion slots in side surfaces configured to receive the defrosting heater.



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Carlstedt et al. further teaches that the evaporator has insertion slots [where tubular member 12 is inserted through fins 14] for the resistance wire [illustrated in figure 1].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the evaporator of Schenk et al. to include the insertion slots in the sides of the fins of the evaporator as taught by Carlstedt et al. in order to conserve space within the cold air duct, enabling the evaporator and defroster to fit into more compact spaces.

6. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jeon as applied to claim 1 above, and further in view of Schenk et al. (US 6,694,754).

Regarding claim 2, Jeon discloses all the limitations of the claimed invention, but fails to disclose a second open/close part on a lower side of the space.

Schenk et al. teach the concept of providing a damper (48) in a lower side of a cooling space [illustrated in figure 2].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the refrigerator of Jeon to include the second open/close part as taught by Schenk et al. in order to advantageously control the amount of air entering the cooling chamber based on the temperature of the interior of the enclosed space, thus increasing operating efficiency.



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7. Claims 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jeon as modified by Schenk et al. as applied to claim 2 above, and further in view of Kim et al. (US 5,987,904).

Regarding claim 3, Jeon as modified by Schenk et al. teach all the limitations of the claimed invention, but fail to teach the limitation of providing a supporting plate having a plurality of openings, and a plurality of rotating plates each having one side coupled to the supporting plate by a hinge, and the other side rotatable upward by a predetermined angle.

Kim et al. teach the concept of providing an opening closing device (50) including supporting plate (56c) having a plurality of openings [space between plates 52], and a plurality of rotating plates (52) each having one side coupled to the supporting plate with a hinge (pivot pin 61) [illustrated in figures 5 and 6], and the other side rotatable upward by a predetermined angle [illustrated in figure 6].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have replaced the upper and lower open/close devices the refrigerator of Jeon as modified by Schenk et al. to with the opening/closing device as taught by Kim et al. in order to provide additional control of the direction of airflow, thus increasing cooling efficiency.

Regarding claim 4, Kim et al. teach that each rotating plate comprises a thin plate [illustrated in figures 5 and 6], that is rotated upward by a predetermined angle to open the respective opening of the plurality of openings [illustrated in figure 6].



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Regarding claim 5, Kim et al. teach that the rotating plate covers an upper circumference of the respective opening to close the opening [as illustrated in figures 5 and 6, it appears that plates 52 will close the area between each of the plates].

Regarding claim 6, Kim et al. teach that the rotating plate is held by a rear end of an adjacent rotating plate and the supporting plate [as illustrated in figures 5 and 6, it appears that when plates 52 are rotated to their vertical position, the unattached ends of plates 52 will have contact with hinges 61], to prevent the rotating plate from rotating downward [the rotating plates 52 as illustrated in figure 5 are capable of performing this operation].

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jeon as applied to claim 1 above, and further in view of Mitani et al. (US 4,569,206).

Regarding claim 8, Jeon discloses all of the limitations of the claimed invention, and further discloses a defrost heater (170) disposed below the evaporator [illustrated in figure 2].

Jeon fail to disclose that the defrosting heater is positioned between the fan and the evaporator.

Mitani et al. teach the concept of positioning a defrost heater (46) between an evaporator (14) and a fan (15) [illustrated in figures 4a, 4b and 8].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the refrigerator of Jeon to instead position the defrost heater between the evaporator and fan as taught by Mitani et al. in order to heat defrost the



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damper positioned above the heater, thus preventing freeze up of the damper when cooling operation is called upon.

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jeon as applied to claim 1 above, and further in view of Block (US 2002/0192075).

Regarding claim 9, Jeon discloses all of the limitations of the claimed invention, but fails to disclose that the defrosting heater is fabricated as one unit with the fan.

Block teaches the concept of providing a heater (15) on impeller blades (12) of a fan (11) [see paragraph 22].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the refrigerator fan of Jeon to include the heater as taught by Block in order to prevent freeze up of the shaft of the fan when cooling operation is called upon, thus increasing the operational efficiency of the refrigerator.

10. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schenk et al. as modified by Carlstedt et al. as applied to claim 13 above, and further in view of Lindseth (US 2000,467).

Regarding claim 14, Schenk et al. as modified by Carlstedt et al. teach all of the limitations of the claimed invention, and Carlstedt et al. teach that the hot wire is bent [illustrated in figure 1, bent in the shape of the conduit]



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Schenk et al. as modified by Carlstedt et al. fail to teach that the hot wire is a carbon hot wire.

Lindseth teaches that it is well known in the art to have a portion of a heating element being made of carbon [see column 2, lines 35-38].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the hot wire of Schenk et al. as modified by Carlstedt et al. to include the carbon as taught by Lindseth in order to reduce the noise generated by the power source and to withstand higher tolerances, thus increasing heating efficiency.

11. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schenk et al. as modified by Carlstedt et al. as applied to claims 12 and 13 above, and further in view of Komatsu (US 5,594,585).

Regarding claims 15 and 16, Schenk et al. as modified by Carlstedt et al. teach all of the limitations of the claimed invention, but fail to teach that the film is formed of PET material and wherein the defrosting heater is a PTC device.

Komatsu teaches the concept of using a positive temperature coefficient thermistor (PTC) heater as a heating device [column 3, lines 41-46] and laminating the PTC heater with a PET film [column 3, lines 46-49].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the film of Schenk et al. as modified by Carlstedt et al. to



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be made of the PET material as taught by Komatsu in order to prevent the while of the cold air duct from being heated, thus increasing cooling efficiency.

Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have replaced the defrost heater of Schenk as modified by Carlstedt et al. with the PTC device as taught by Komatsu in order to regulate the defrost temperature without a temperature control circuit, thus increasing efficiency.

12. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schenk et al. as modified by Carlstedt et al. as applied to claim 12 above, and further in view of Seipp et al. (US 3,786,227).

Regarding claim 19, Schenk et al. as modified by Carlstedt et al. teach all the limitations of the claimed invention, but fail to teach that the defrosting heater has pass through holes for at least one of the refrigerant pipes.

The general concept of providing a defrosting heater having pass through holes for pass through of the refrigerant pipes of an evaporator falls within the realm of common knowledge as obvious mechanical expedient, and is illustrated by Seipp et al. which teaches a heat exchanger defrost apparatus [see figure 3] that includes a defrost heater (20) thermally connected to a plate (15), wherein the plate has perforations (25) for the heat exchanger tubes to pass therethrough [see column 2, lines 33-36], and one having ordinary skill in the art would have been motivated to include the use of a defrosting heater having pass through holes for pass through of the



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refrigerant pipes of an evaporator in order to conserve space within the cold air duct, enabling the evaporator and defroster to fit into more compact spaces.

13. Claims 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schenk et al. as modified by Carlstedt et al. and Jeon as applied to claim 22 above, and further in view of Kim et al.

Regarding claim 23, Schenk et al. as modified by Carlstedt et al. and Jeon teach all the limitations of the claimed invention, but fail to teach the limitation of providing a supporting plate having a plurality of openings, and a plurality of rotating plates each having one side coupled to the supporting plate by a hinge, and the other side rotatable upward by a predetermined angle.

Kim et al. teach the concept of providing an opening closing device (50) including supporting plate (56c) having a plurality of openings [space between plates 52], and a plurality of rotating plates (52) each having one side coupled to the supporting plate with a hinge (pivot pin 61) [illustrated in figures 5 and 6], and the other side rotatable upward by a predetermined angle [illustrated in figure 6].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have replaced the upper and lower open/close devices the refrigerator of Schenk et al. as modified by Carlstedt et al. and Jeon to with the opening/closing device as taught by Kim et al. in order to provide additional control of the direction of airflow, thus



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increasing cooling efficiency.

Regarding claim 24, Kim et al. teach that each rotating plate comprises a thin plate [illustrated in figures 5 and 6], that is rotated upward by a predetermined angle to open the respective opening of the plurality of openings [illustrated in figure 6].

Regarding claim 25, Kim et al. teach that the rotating plate covers an upper circumference of the respective opening to close the opening [as illustrated in figures 5 and 6, it appears that plates 52 will close the area between each of the plates].

### ***Response to Arguments***

14. Applicant's arguments filed 12/2/2008 have been fully considered but they are not persuasive.

The regard to the rejection of claims 1 and 7 over Jeon, the Applicant contends that Jeon fails to disclose or suggest a fan in the cold air duct that selectively directs the cold air in an upward or downward direction and an open/close device that selectively opens and closes a space containing the evaporator, the defrosting heater, and the fan positioned therein, wherein the open/close device is configured to be rotated by a force of a flow of the cold air generated by rotation of the fan. The Examiner respectfully disagrees. As taught in Jeon in column 5, lines 1-5 and disclosed in figure 2, the fan directs air upwardly to the freezer compartment. The fan can selectively perform this operation per the operation of the refrigerator. Also, as taught in column 9, lines 59-64, the open/close device selectively opens and closes the area where the fan directs



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air to the freezer chamber. In addition, the applicant has not established the extent of the space being closed and the Examiner has interpreted that the space can be closed off to the freezer chamber. Furthermore, as described above, as illustrated in figure 2, the open/close device and the fan are positioned in a fashion to allow the movement of the open/close device to be caused by the rotation of the fan. As such the force of air generated by the fan is capable of displacing the open/close means.

The regard to the rejection of claims 1-20 and 22-25, the Applicant contends that Schenk et al. as modified by Carlstedt et al. fail to disclose or suggest a fan in the cold air duct that selectively directs the cold air in an upward or downward direction and an open/close device that selectively opens and closes a space containing the evaporator, the defrosting heater, and the fan positioned therein, wherein the open/close device is configured to be rotated by a force of a flow of the cold air generated by rotation of the fan. The Examiner respectfully disagrees. As disclosed in Schenk et al. in figure 2, the fan directs air upwardly to the freezing chamber and downwardly to the refrigerating chamber. The fan can selectively perform this operation per the operation of the refrigerator. Also, as taught in column 8, lines 49-54, the open/close device selectively opens and closes the area where the fan directs air from the refrigerating chamber. In addition, the applicant has not established the extent of the space being closed and the Examiner has interpreted that the space can be closed off to the freezer chamber. Furthermore, as described above, as illustrated in figure 2, the open/close device and the fan are positioned in a fashion to allow the movement of the open/close device to be caused by the rotation of the fan. As such the force of air generated by the fan is capable of displacing the open/close means.



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In conclusion, for at least these reasons, the Examiner respectfully submits that the rejections of claims 1-20 and 22-25 are properly upheld.

***Conclusion***

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AZIM RAHIM whose telephone number is (571) 270-1998. The examiner can normally be reached on Monday - Thursday 7am - 3pm EST and Friday 7am - 9:30am EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frantz Jules can be reached on 571-272-6681 or Cheryl Tyler at 571-272-4834. The



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fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. R./

Examiner, Art Unit 3744

3/4/2009

/Frantz F. Jules/

Supervisory Patent Examiner, Art Unit 3744